

ABSTRACT OF THE DISCLOSURE

A process to fracture connecting rods and the like, that are made of high strength materials, comprises of the following mechanisms:

- (a) Fatigue: fluctuation of stresses in a pre-notched connecting rod due to the use of harmonic excitation will extend the notch tip in the connecting rod and will weaken the predetermined fracture plane by creating micro-cracks,
- (b) Resonance: resonance occurs when the frequency of the used harmonic excitation matches a natural frequency of the connecting rod, idealized as a structural system,
- (c) Pre-stressing forces: by applying pre-stressing forces acting in the same loading mode, the stresses in the connecting rod due to several force components can be superimposed,
- (d) Dynamic force: applying a dynamic force will raise the stress intensity factor, exceeding the fracture toughness of the material.